

Monthly snowfall and amounts on ground, etc.—Continued.

State and station.	Total.	15th.	31st.	State and station.	Total.	15th.	31st.
<i>W. Virginia—Cont'd.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>	<i>W. Virginia—Cont'd.</i>	<i>Inches.</i>	<i>Ins.</i>	<i>Ins.</i>
Raleigh.....	11.0	.....	9.0	Wheeling a.....	11.5	0.0	6.0
Rowlesburg.....	19.0	.....	.....	Wheeling b.....	10.0	.....	8.0
Sandyville.....	13.0	.....	10.0	Wisconsin.			
Spencer.....	16.0	0.0	16.0	Amherst.....	13.5	.....	.....
Tannery.....	20.0	0.0	20.0	Wyoming.			
Westona.....	20.0	0.0	2.0	Fort Yellowstone.....	13.1	.....	.....
Weston b.....	18.0	.....	8.0				

SLEET.

The following are the dates on which sleet fell in the respective States:

Alabama, 30. Arizona, 27, 28. Arkansas, 1, 26, 30, 31. California, 6, 7. Colorado, 1, 10, 20, 22, 23. Connecticut, 1, 2, 8, 9, 11, 12, 17, 26, 27. Delaware, 26. Georgia, 4, 30, 31. Idaho, 6, 19, 20, 31. Illinois, 3. Indiana, 12, 24. Iowa, 9, 10, 11, 24. Kansas, 10, 11. Kentucky, 25, 26. Louisiana, 25, 26, 30. Maine, 12, 17, 27, 30. Maryland, 10, 24, 26. Massachusetts, 1, 2, 8 to 11, 24, 27. Michigan, 1, 11, 12, 24, 29.

WIND.

PREVAILING DIRECTIONS.

The prevailing winds for December, 1894, viz, those that were recorded most frequently at Weather Bureau stations, are shown in Tables I and VIII; they are not given on Chart II, as has hitherto been the custom, but the resultant winds are published instead.

RESULTANT WINDS.

The resultant winds for the current month, as deduced from the hourly readings of self-registers at about 67 regular Weather Bureau stations, are given in Table VIII. Other resultants, deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, in connection with the isobars based on the same system of simultaneous observation; the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a wind of average velocity; these figures (or the ratio between them and the total number of observations in this month) indicate the extent to which winds from different directions counterbalanced each other. The original north, south, east, and west components are given in detail in Table IX.

During December the resultant movement was generally from the northwest in New England, northwest in the middle and south Atlantic States, southwest in the Ohio Valley and Tennessee and southern Rocky Mountain slope, northeast in the Gulf States, and southeast in the north Pacific coast region.

HIGH WINDS.

Maximum wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		<i>Miles.</i>				<i>Miles.</i>	
Amarillo, Tex.....	7	56	w.	Buffalo, N. Y.....	12	50	w.
Do.....	10	54	nw.	Cheyenne, Wyo.....	20	72	w.
Do.....	15	58	sw.	Chicago, Ill.....	16	60	sw.
Block Island, R. I.....	26	62	e.	Eastport, Me.....	27	60	ne.
Do.....	27	68	e.	El Paso, Tex.....	10	54	nw.
Boston, Mass.....	27	50	ne.	Erie, Pa.....	10	51	se.

Minnesota, 1, 8, 10, 15, 16, 21, 23, 24. Mississippi, 26, 27, 29, 30. Missouri, 1, 10, 11, 23. Montana, 20. Nebraska, 9, 10, 11. Nevada, 5, 6. New Hampshire, 11, 27. New Jersey, 1, 6, 10, 11, 24 to 27. New Mexico, 7, 8, 28. New York, 1, 2, 10 to 13, 17, 22, 25, 26, 27. North Carolina, 5, 26, 27, 28, 29, 31. North Dakota, 7, 8, 23. Ohio, 10, 12, 21, 25, 27. Oregon, 1, 5, 6, 10, 11, 14, 16, 24, 25, 26, 29, 30. Pennsylvania, 1, 2, 9 to 12, 24 to 27. Rhode Island, 1, 9, 11, 28. South Carolina, 7, 8, 26, 28, 30, 31. South Dakota, 8, 24, 26, 31. Tennessee, 3, 26, 27. Texas, 31. Utah, 6, 9, 20. Vermont, 11, 27. Virginia, 4, 26, 27, 29. Washington, 5 to 8, 10, 14, 17, 22. West Virginia, 10, 23, 26, 27. Wisconsin, 11, 24.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 10, 11. Arkansas, 9. California, 6, 9, 19, 21. Georgia, 11, 17. Illinois and Indiana, 8. Louisiana, 3, 9, 10. Mississippi, 10, 11. Missouri, 8, 24. North Carolina, 26. Ohio, 8. Oregon, 7, 18. South Carolina, 12. Tennessee, 11. Texas, 9, 10. Washington, 6.

Wind velocities of 50 miles, or more—Continued.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		<i>Miles.</i>				<i>Miles.</i>	
Fort Canby, Wash.....	7	59	se.	Portland, Oreg.....	7	54	sw.
Do.....	7	59	se.	Do.....	7	54	sw.
Do.....	7	59	e.	Rapid City, S. Dak.....	20	58	sw.
Do.....	7	56	e.	Sacramento, Cal.....	7	56	se.
Do.....	9	52	s.	Tatoosh Island, Wash..	7	76	e.
Do.....	10	62	se.	Do.....	7	56	sw.
Do.....	11	77	se.	Do.....	9	56	se.
Do.....	16	50	se.	Do.....	10	50	s.
Do.....	20	52	e.	Do.....	11	52	s.
Do.....	29	58	se.	Do.....	29	55	e.
Hatteras, N. C.....	29	54	nw.	Winnemucca, Nev.....	20	50	sw.
Huron, S. Dak.....	20	53	sw.	Woods Holl, Mass.....	13	50	sw.
Independence, Cal.....	9	52	w.	Do.....	27	72	sw.
Lander, Wyo.....	20	60	sw.				

LOCAL STORMS.

Destructive or severe local storms were reported as follows:

6th.—San Francisco, Cal., thunderstorm.

7th.—Napa, Cal., windstorm.

8th.—Fox Creek, Mo., hailstorm.

9th.—Seattle, Wash., Astoria, Oreg., and Sacramento, Cal., windstorms.

10th.—Erie, Pa., windstorm. Near Richland, Ga., windstorm. Kingston, Ga., thunderstorm; ten persons injured. Westville, Fla., severe windstorm, funnel-shaped cloud; several persons badly injured. Summerfield, La., and Omega, La., thunderstorms. White Castle, La., severe windstorm; one person killed and about ten injured.

11th.—Berkeley, Cal., windstorm.

12th.—Forsyth and Reynolds, Ga., thunderstorms.

19th.—Heber, Utah, windstorm.

20th.—Cross, S. Dak., and Fort Laramie, Wyo., windstorms.

WIND SIGNALS FOR DECEMBER.

As it seems improper to assign the necessity for a high wind signal to the presence of an area of low pressure when there is an equally important area of high pressure adjacent, the Editor has transferred the enumeration of the wind signals from the sections on high and low areas to the present section on "Wind."

In the following list the hours at which the respective signals were hoisted are given in each case, using seventy-fifth meridian time uniformly:

2d, 11 a. m., westerly, information, Lakes Huron and Michigan, Sault Ste. Marie section, Marquette section, and Houghton section; 10.50 p. m., northwest, storm, Sandy Hook to Eastport.

3d, 11.50 a. m., west, information, Buffalo.

4th, 5.20 p. m., westerly, information, Lakes Superior, Michigan, and Huron.

6th, 10.10 a. m., southeast, storm, Lakes Michigan and Superior, except easterly, information, Duluth; 5.30 p. m., easterly, information, Lake Huron; 11 p. m., easterly information, Lake Erie.

7th, 10 a. m., east, information, Lake Michigan.

8th, 7.30 p. m., southwest, storm, Lake Erie; 11 p. m., storm, southwest, Lakes Ontario and Erie, except Erie and section; 11 p. m., information, Sandy Hook to Eastport.

9th, 7.40 a. m., Buffalo, changed to storm, northwest.

10th, 9.55 a. m., storm, northeast, Detroit; 10.20 a. m., storm, northeast, Milwaukee, Chicago, Grand Haven, Ludington, and Manistee; 10.30 a. m., northeast, Narragansett section and Woods Holl section; 11.30 a. m., storm, southeast, Lakes Erie and Ontario; 4.15 p. m., storm, northeast, New York to Boston, except Narragansett and Woods Holl sections; 4.15 p. m., southeast, storm, Sandy Hook to Norfolk section.

11th, 11 a. m., northeast, storm, Sandy Hook to Boston; 11.15 a. m., continued southeast, storm, on Lakes Erie and Ontario; continued northeast, storm, Narragansett and Woods Holl section.

12th, 11.15 a. m., continued storm, southeast, on Lakes Erie and Ontario; 11.15 a. m., continued northeast, storm, Narragansett and Woods Holl section; 1 p. m., changed to storm,

northwest, Lake Erie; 3 p. m., changed to storm, northwest, Lake Ontario; 11 p. m., changed to storm, northwest, Sandy Hook to Boston section.

13th, 11.15 a. m., storm, northwest, Portland and Eastport; 1 p. m., continued storm, northwest, Buffalo.

14th, noon, changed to storm, southwest, Buffalo.

15th, 10 p. m., storm, southeast, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington.

16th, 10.30 a. m., changed to storm, northwest, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington; 11 p. m., storm, southwest, Breakwater to Eastport.

20th, 10 p. m., storm, southwest, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington.

21st, 10 a. m., changed to storm, northwest, Chicago, Milwaukee, Grand Haven, Manistee, and Ludington.

24th, 11.30 p. m., storm, southeast, Woods Holl section to Eastport; 11.40 p. m., storm, southeast, Narragansett section.

26th, 11.20 a. m., storm, northwest, Port Eads, New Orleans, Mobile, Pensacola, and Jacksonville section to Washington, N. C.; 11 p. m., storm, northeast, Norfolk section to Woods Holl section.

27th, 10 a. m., storm, northwest, Lake Michigan; storm, northeast, Portland and Eastport; 11.30 a. m., changed to storm, northwest, New Haven to Woods Holl section and New York to Norfolk section; 10 p. m., changed to storm, northwest, Boston to Eastport; 11.20 p. m., storm, northwest, Galveston.

28th, 11 a. m., storm, northwest, Port Eads to Pensacola; 10.20 p. m., storm, northwest, Cedar Keys to Sandy Hook.

29th, 5.30 p. m., storm, northwest, Narragansett section.

ATMOSPHERIC ELECTRICITY.

GENERAL STATISTICS.

The table showing in detail for December, 1894, the statistics relative to auroras and thunderstorms is placed among the meteorological tables as No. XI, instead of being given in the text as heretofore. It shows the number of stations from which meteorologic reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month.

THUNDERSTORMS.

A mention of the more severe thunderstorms reported during the month is made under "Local storms." The dates on which reports of thunderstorms were most numerous were: 1st, 20; 8th, 73; 9th, 31; 10th, 38; 11th, 67; 12th, 66.

The States where thunderstorm reports were most numerous were: Alabama, Florida, Georgia, Louisiana, Missouri, North Carolina, and Ohio.

The States where the dates of thunderstorms were most frequent were: Louisiana, where they were recorded on eight days; Missouri, eight days; North Carolina, six days.

AURORAS.

The evenings on which bright moonlight must have inter-

fered with observations of faint auroras are assumed to be the four days preceding and following the date of full moon, viz, from the 8th to the 16th, inclusive. On the remaining twenty-two days of this month 35 reports were received, or an average of about one per day. The dates on which the reported number especially exceeded this average were: 15th, 3; 18th, 3; 21st, 3. The States from which auroras were reported by a large percentage of observers were: Indiana and North Dakota.

The States where the dates of auroras were most frequent were: Wisconsin, 7; North Dakota, 6; Indiana, 5.

Canadian data.—December, 1894.

Stations.	Dates of thunderstorm.	Dates of auroras.
Quebec, Que.....	6, 27
Toronto, Ont.....	15
Minneapolis, Minn.....	6, 21, 22
Medicine Hat, Assin.....	9, 10
Edmonton, Alberta.....	4, 7, 13

DAMAGE BY LIGHTNING.

No reports have been received of damage done by lightning during December.

METEOROLOGY AND MAGNETISM.

The movements of our atmosphere are to be studied primarily as problems in the mechanics and thermodynamics of moving gases and vapors, but our knowledge of the empirical relations between atmospheric phenomena and terrestrial magnetism has been elucidated by a few special students, and

further study in this direction has been recognized by the Chief of the Weather Bureau as proper and desirable. As the subject of atmospheric electricity, including that of auroras and earth currents, has a small section in this REVIEW, Professor Bigelow contributes the following section on terrestrial magnetism.